

BOOK REVIEW

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Revisión monográfica de los *Canthonina* americanos, parts I, II, and III. Gonzalo Halffter and Antonio Martinez, *Revista de la Sociedad Mexicana de Historia Natural* 27:89-177, 28:79-116, 29:209-290, illus. (1966, 1967, 1968).

The canthonines are a group of ball-rolling dung beetles found primarily in the southern continents and islands of the world, being most richly represented in South America. The only existing revision of the American (that is, New World) species was that of Edgar von Harold (1868), on *Canthon sensu lato*, until about 30 years ago. At that time, Renaud Paulian reviewed the group, concentrating on those species in the genus *Deltochilum*, and Vladimir Balthasar keyed most of the remaining species, which he placed in *Canthon*, ignoring several previous attempts to divide that genus. About 20 years ago, a group of Latin American workers, Francisco Pereira, Antonio Martinez, and Gonzalo Halffter, first turned their attention to the American canthonines, beginning the process of specific and generic description and re-evaluation of supra-specific categories which is continuing to the present day. In view of the very large size and diversity of the group, and the location of many types in Europe, this process has been a particularly difficult one and the results up to now have been quite unsatisfactory for those workers such as the present reviewer who have had to deal with some small sections of the group. This dissatisfaction has stemmed not from the quality of the work produced, which generally has been high, but from the piece-meal approach which the Latin American workers have had to adopt. This approach has been to attack the great mass of species from around the edges, detaching first those elements which appeared most divergent and leaving a heterogeneous and nebulous centre. While each detached portion has generally been clearly defined as a separate genus, the status of this genus could never be objectively evaluated since it could not be compared with the vague central mass or the other quite unrelated detached portions.

Lost in the centre has been the genus *Canthon* itself, by far the largest of the group and the one collectors were most likely to encounter. It is true that a very thorough revision and morphological analysis of the North American *Canthon* were produced by Halffter in 1961, but this still left the bulk of the species untouched, and any worker wishing to identify a South American *Canthon* had to (and still has to) turn to Harold and Balthasar.

The general confusion was compounded by the large number of short, somewhat incoherent papers which the workers in question continued to produce over the years, often in obscure journals. It is true that in 1956 Pereira and Martinez attempted to review and define most of the American canthonine genera, but their effort did little to clarify the situation, as the state of knowledge of the group at that time was such that it was impossible to define any generic limits convincingly. Genera were grouped in a

totally artificial manner and not adequately compared with other genera. Some genera appeared to be of much lower rank than others. The outside observer could not judge from the evidence given whether any genus was valid or not, either as a genus *per se* or even as a natural grouping of any sort. His instinctive reaction was to reject the new generic categories out of hand.

Into this welter of confusion the two most competent workers in the group, Gonzalo Halffter and Antonio Martinez, have now boldly stepped. Although only the first three parts of their work have appeared, the time is opportune to call attention to the existence of this very important effort. The professed aim of the authors is to adopt uniform criteria for the first time in reconsidering all the American Canthonina. A secondary aim is, finally, to mount a determined assault on the genus *Canthon* itself.

They begin with a brief consideration of the status of the tribe Scarabaeini and the sub-tribe Canthonina, for which they provide a diagnosis which will be useful to workers in other parts of the world. They point out that while it is not incorrect to elevate the canthonines (and all other subtribes) to tribal level, this process when carried to its logical conclusion would elevate the family Scarabaeidae to a superfamily and throw the classification of the Coleoptera off balance. What is incorrect is arbitrarily raising some equivalent categories to higher rank and not others, as Paulian has done in the "Traité." They accept the Eurysternini as a separate tribe, but they do not adequately distinguish it from the Scarabaeini. Except for the elevation of the Eurysternini, the higher classification adopted is that proposed by André Janssens in 1949 and now generally accepted. They trace this classification back to L. A. Péringuey in 1900, but this reviewer would consider its beginnings to have been established by G. van Lansberge in 1874.

The genera are treated one by one, and for each a diagnosis is given, its affinities discussed, the type species named, the included species and their distributions listed, and keys presented to the subgenera, species groups, species, and subspecies. Line drawings, maps and photographs are used, including some microphotographs of mouthparts and genitalic characters. Some genera previously proposed, such as *Peltecanthon*, are adequately described for the first time, other genera are lowered to subgenus rank, one genus (*Agamopus*) is brought in from the tribe Coprini, several new species are described, and previously unknown morphological details are revealed, of which perhaps the most interesting are the small teeth present on the galea of *Sinapisoma*, the only known scarabaeine with a non-membranous distagalea. The very unusual genitalic capsule of *Ipselissus* is described for the first time, and a very interesting analysis is presented of the similarities between four genera around *Ipselissus*, which together have a distribution as follows: Brazil and adjacent areas, the Greater Antilles, South-western Australia, and Mauritius. Unfortunately so much emphasis is placed on the similarities between these genera that their differences are obscured, and it is not altogether clear from the discussion why the South American *Ipselissus* and the Antillean *Canthonella* are maintained as separate genera. Some genera such as *Scybalophagus* are treated in more detail because of inadequate previous coverage, and new distributional and biological data are presented for these.

Nearly all the categories proposed by previous workers are maintained as natural groups, although a few are lowered to subgeneric rank. In some instances this action appears questionable, but until all the parts of the monograph have appeared it is not possible to come to a decision about this, for it is important to emphasize that we are not out of the woods yet. The authors state that they are leaving the final analysis of the genera and their phylogenetic arrangement to the last, and there will not even be any key to the genera until then. The non-specialist is still not always able to identify a specimen to genus and is still faced with pretty much the same problems as before, being encouraged only by the prospect that at the end he will finally be able to put the pieces of the puzzle together. As the authors themselves point out, the order of presentation of the genera in the present series is artificial and even illogical, with fairly typical canthonine genera such as those around *Megathopa* sandwiched between highly aberrant forms such as *Eudinopus* and *Streblopus*, and other genera quite artificially associated following the original arrangement of Pereira and Martinez.

The standard of work is very high and great care has been taken in the preparation of the descriptions and keys. In the first three parts, the authors have got as far as the first subgenus of the genus *Canthon*. Thirteen genera have been treated, something over one third of the total, but the two largest, *Canthon sensu stricto* and *Deltochilum*, remain to be considered.

The same characters, about 55 in number, are investigated in each genus. This not only enables uniform criteria to be adopted in the group for the first time, but it also permits numerical analysis of the classification, something which the authors have promised to present in the last part, together with a more traditional phylogenetic analysis and a key to the genera.

Dr. Halffter spent several months in the Paris Museum studying the very large collection there inherited from Edgar von Harold, A. Boucomont, and other dung beetle specialists, and both authors have had very extensive field experience in South and Central America and Mexico.

When this work is completed, we will at long last have a clear picture of the classification of the American Canthonina and a usable system which will permit the identification of any species. In eager anticipation of this triumphant moment we can now only encourage Drs. Halffter and Martinez to continue, with all deliberate speed, the excellent work that they have begun.